

THE EFFECT OF DIETARY CAPRYLIC ACID ON THE *SALMONELLA* SPP. SHEDDING IN EXPERIMENTALLY INFECTED BROILER CHICKENS

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The aim of this study was to evaluate the effect of caprylic acid (CA) on counts of salmonellas and coliforms in chickens which were reared on feed that was experimentally contaminated with *Salmonella* Enteritidis (Experiment 1). Furthermore, the effect of caprylic acid on salmonellas attached to broiler skin was tested (Experiment 2).

Experiment 1: <ul style="list-style-type: none">- Fourteen days old male Ross 308.- Housed individually in metabolic cages.- Fed a commercially available diet, <i>ad libitum</i>.- Control diet vs. diet supplemented with 2.5 or 5 mg/ml of CA.- 2nd day: feed was contaminated with <i>Salmonella</i> Enteritidis ATCC 13076 (Log₁₀ CFU/ml = 9).- Daily check of mortality and morbidity.- 8th day: euthanised; crop and caecum taken for microbiological analyses.- Selective cultivation & quantification on XLD and Mac Conkey agars.	Experiment 2: <ul style="list-style-type: none">- One day old male Ross 308, kept in a floor pen with wooden shavings.- Fed a commercially available wheat-soybean-maize diet, <i>ad libitum</i>.- No experimental diets during the fattening.- 35th day: slaughtered, chicken carcasses obtained & chilled for 24h/4°C.- After chilling stage, carcasses were washed & subsequently surface-contaminated with <i>S. enteritidis</i> ATCC 13076 (Log₁₀ CFU/ml = 6).- One half was treated with 0.75 mg/ml of CA for 1 min, the second half was kept as a control (treated with sterile saline for 1 min).- Selective cultivation & quantification on XLD and Mac Conkey agars.
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Results:

The influence of CA (2.5 g/kg) on numbers* of coliforms and salmonellas (log₁₀ CFU/g) in crop and caecum contents of infected chickens

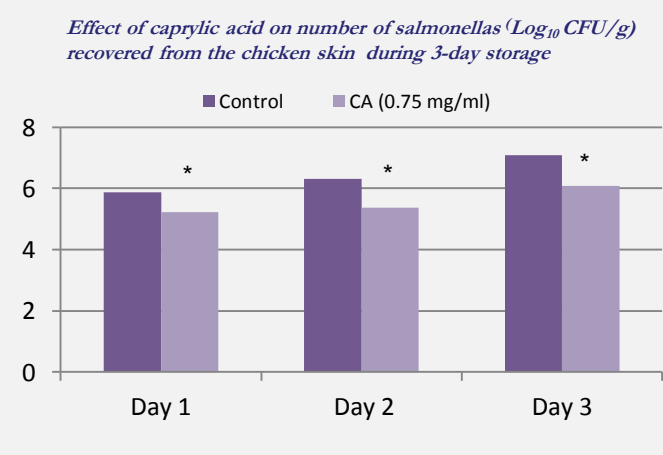
	Crop contents			Caecum contents		
	Negative control	Positive control	C ₈	Negative control	Positive control	C ₈
Coliforms	5.2 ± 0.6 ^a	4.9 ± 0.5 ^a	3.2 ± 0.5 ^b	6.9 ± 0.7 ^a	6.3 ± 0.4 ^a	4.9 ± 0.4 ^b
Salmonellas	< 2 ^b	4.7 ± 0.3 ^a	< 2 ^b	< 2 ^b	3.2 ± 0.3 ^a	< 2 ^b

*Means ± SD
^{a, b}Values of crop or caecum contents in the same row with the different superscript are significantly different (P < 0.05)

The influence of CA (5 g/kg) on numbers* of coliforms and salmonellas (log₁₀ CFU/g) in crop and cloaca contents of infected chickens

	Crop contents			Caecum contents		
	Negative control	Positive control	C ₈	Negative control	Positive control	C ₈
Coliforms	6.8 ± 0.4 ^a	6.1 ± 0.9 ^a	3.1 ± 0.6 ^b	7.9 ± 0.5 ^a	8.4 ± 0.4 ^a	6.5 ± 0.6 ^b
Salmonellas	< 2 ^b	5.0 ± 0.7 ^a	< 2 ^b	< 2 ^b	4.1 ± 0.3 ^a	< 2 ^b

*Means ± SD
^{a, b}Values of crop or caecum contents in the same row with the different superscript are significantly different (P < 0.05)



Experiment 1:

- In both experimental infections, feed contaminated with *S. Enteritidis* increased counts of salmonellas both in the crop and caecum.
- Caprylic acid reduced salmonellas in the crop and caecum below the detection limit.
- Concentration of 5 g/kg in the feed reduced numbers of coliforms by > 3 orders in crop, and by > 2 orders in caecum.

Experiment 2:

- Prior to the inoculation, chicken skin was free of salmonellas (Log₁₀ CFU/g < 2).
- Surface treatment with caprylic acid significantly decreased *Salmonella* spp. contamination of chicken skin.

It can be concluded that caprylic acid is able to reduce numbers of salmonellas in the gastrointestinal tract of chickens and has a potential to improve health status of infected animals. The surface treatment of chicken skin with caprylic acid may be considered as another way of application.